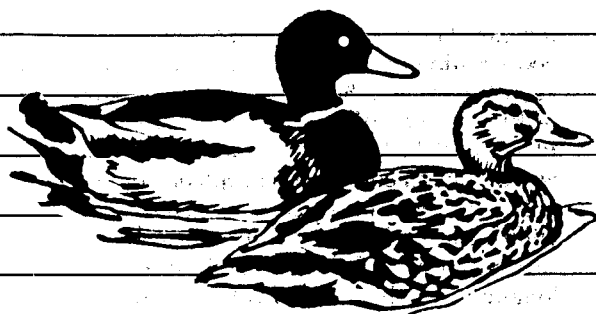


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Research

Information bulletin

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Aerial Surveys of Mallards Wintering in the Mississippi Alluvial Valley

The Mississippi Alluvial Valley (MAV) extends from Cape Girardeau, Missouri, to southern Louisiana (Fig. 1) and is widely recognized as the most important wintering area for midcontinental mallards (*Anas platyrhynchos*). The quality of mallard winter habitat in the MAV varies annually and depends on the extent of seasonal flooding of bottomland agricultural fields and forests. Previous research indicates that mallards have more feeding opportunities, weigh more, survive better, and are attracted to the MAV in greater numbers during winters with more flooding and better habitat conditions. We do not know the number or proportion of mallards wintering in the MAV that depend on seasonally flooded habitats that are susceptible to drainage. However, progress in the design of aerial surveys now makes it possible to estimate population numbers with the precision necessary for management decisions. We conducted the first of five experimental aerial surveys during the winter of 1987-88. Our objectives were to determine the number of mallards in the MAV, their dependence on natural flooding, and the level of use of forested wetlands.

Sampling Used Two Levels of Stratification

After the exclusion of upland areas that were not mallard habitat, the survey area encompassed 8.9 million ha. We used stratified random sampling in an attempt to reduce variation. At the first level, portions of seven states were assigned to four strata that generally followed state boundaries. At the second level, the 4 strata were divided into 16 substrata, based on mallard densities obtained from 10 years (1970 through 79) of annual midwinter

waterfowl surveys. Sampling effort was allocated among survey strata and substrata proportional to land area and mallard densities by using the Neymann formula.

Our basic sampling units were random transects (actually long, narrow plots) oriented east and west across the substrata. Transects were 500 m wide, 8 to 102 km long, and flown at an altitude of 76 to 152 m with a pilot and two observers. Observers counted mallards, classified habitat use, and designated water regimes as unmanaged (naturally flooded) or managed (pumped or impounded).

Important Habitat Components Identified

One hundred and twelve hours of flight time were required to sample 9,350 km² (10.5%) of the MAV. Observers recorded 211,000 mallards (2,016 flocks) during the survey. The population of mallards wintering in the MAV was estimated to be 1,780,000 (standard error = 162,000), with a coefficient of variation of 9.1%. Most (84%) mallards observed during the survey were associated with agricultural habitats; fewer were found on forested (10%) and nonforested (6%) wetlands. Mallards were most frequently observed on soybean (44%) and rice (24%) fields. Seventy-seven percent of all mallards were observed on unmanaged water.

Our initial survey indicates that mallards in the MAV are highly dependent on temporary winter water. Failure to protect this important habitat component, which occurs primarily on private lands, may result in additional losses of waterfowl carrying capacity on the wintering grounds.

Fortunately, opportunities for maintaining the values of naturally flooded private lands for waterfowl have

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increased in recent years as a result of wetland conservation provisions of the "Farm Bill" (Food Security Act of 1985) and the Water Resources Development Act of 1986. The North American Waterfowl Management Plan (NAWMP) establishes waterfowl population goals and outlines a continental scope of work to stem wetland habitat losses. One aspect of the NAWMP emphasizes enlisting the voluntary efforts of individuals in the private sector to provide habitat, thereby ensuring that the long-term needs of waterfowl resources will be met.

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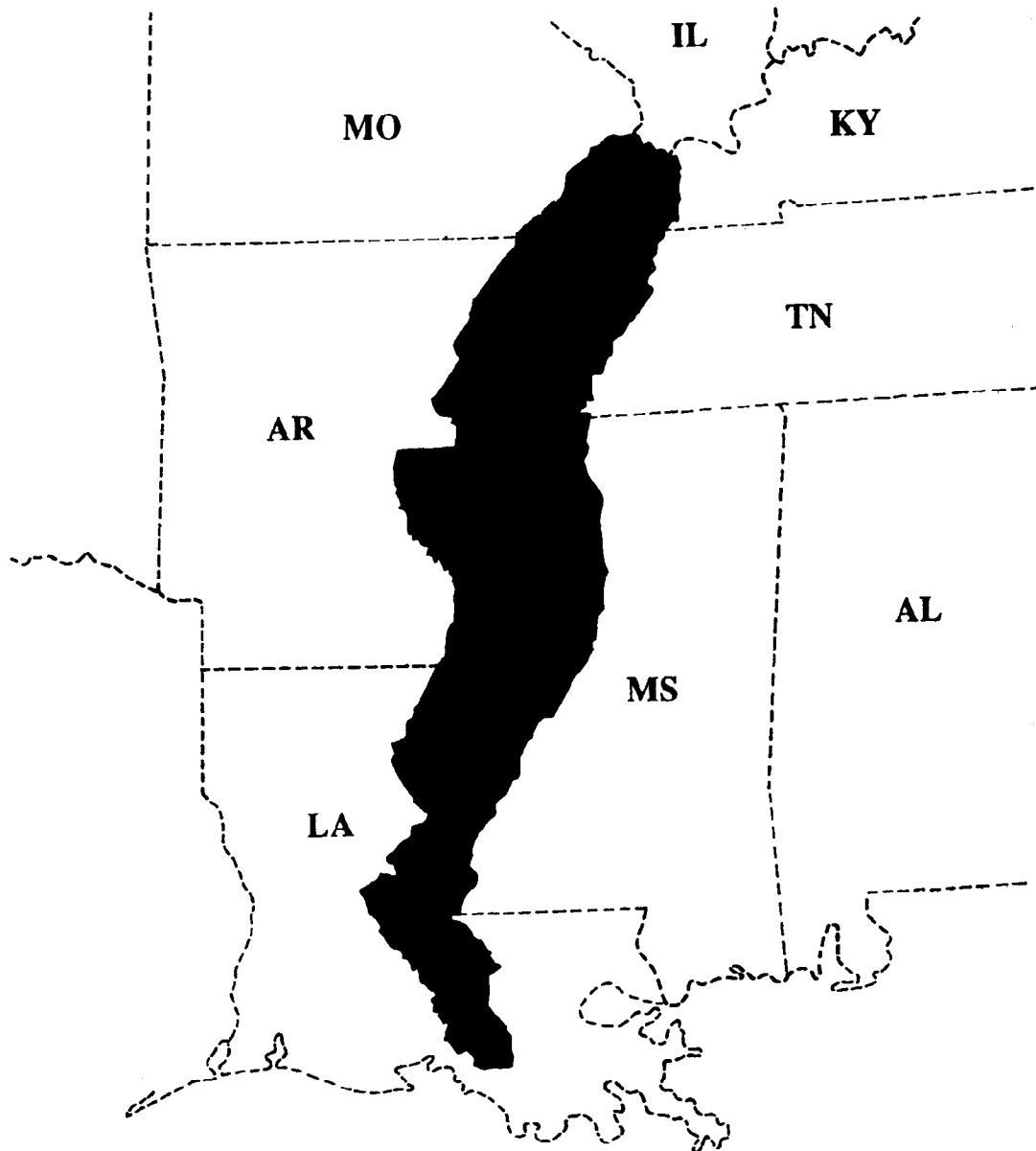


Figure 1. The Mississippi Alluvial Valley, where mallards were surveyed in January–February 1988.